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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,085	07/31/2006	Nobuyuki Kibino	Q79795	4026
23373 7590 05/27/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
HAIN, TOBY				
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4131				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/588,085

**Applicant(s)**

KIBINO ET AL.

**Examiner**

TOBY D. HAIN

**Art Unit**

4131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 16-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CD/CC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 7/31/2006

## DETAILED ACTION

### *Claims Status*

1. Utility application 10/588,085 contains 28 claims. Claims 1-15 are under consideration as members of an elected invention while claims 16-28 are withdrawn from consideration as being nonelected. This is the first action on the merits.

### *Election/Restrictions*

2. Restriction is required under 35 U.S.C. 121 and 372.

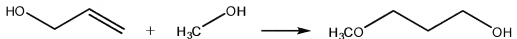
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 1-15, drawn to methods of production of 3-alkoxy-1-propanol, the compound, and hydrolysis thereof.

Group II, claims 16-28, drawn to methods of production of 1,3-propanediol and the diol compound.

3. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the technical features do not define a contribution over the prior art. The common technical feature in Groups I and II is the reaction of allyl alcohol and alcohol to form 3-alkoxy-1-propanol. However, Yamakawa *et al.*, 2 CATAL. COMMUN. 191, 191-194 (2001), teaches the following synthesis



Hence, the synthesis of 3-alkoxy-1-propanols from allyl alcohol and methanol is known in the prior art and cannot form the basis of a special common technical feature, and election to either Group I or II is required.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. During a telephone conversation with Bruce Kramer on May 12, 2009, a provisional election was made without traverse to prosecute the invention of Group I, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-28 (of Group II) are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

**Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.**

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

***Priority***

7. It is noted that this application appears to claim subject matter disclosed in prior Application No. PCT/JP05/02089, filed Feb. 4, 2005. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under

35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was

unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

8. If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required.

Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP §

201.11. Applicant is advised of possible benefits under 35 U.S.C. 119(a)-(d), wherein an application for patent filed in the United States may be entitled to the benefit of the filing date of a prior application filed in a foreign country.

#### ***Information Disclosure Statement***

9. The information disclosure statement (IDS) submitted on Jul. 31, 2006, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Oath/Declaration***

10. It was not executed in accordance with either 37 CFR 1.66 or 1.68.

#### ***Specification***

11. The abstract of the disclosure is objected. A chemical equation illustrating the inventive concept should be added to the abstract. Correction is required. See MPEP § 608.01(b).

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

12. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with grammar errors, is unclear, and lacks idiomatic language throughout. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph.



***Claim Objections***

13. Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, to amend the claim in order to place the claim in proper dependent form, or to rewrite the claim in independent form. Claim 11 depends from claim 2 and contains aryl moieties in a Markush group; however, claim 2 is drawn to alkoxy containing alcohols, which are alkanols and as such do not include aryl compounds. Hence, claim 11 is broader than claim 2.

***Claim Rejections - 35 USC § 112***

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claims 1-3, 7-9, and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1 and 2 are the sole independent claims and are directed to producing 1,3-propanediol and 3-alkoxy-1-propanol via reaction of an allyl alcohol with an alcohol in the presence of a group III, lanthanoid, or actinoid catalyst. The issue is whether Applicant possesses the claimed use of actinoid species as a catalyst, and the outcome of which turns on whether Applicant has adequately described the use of actinoid-containing catalysts as claimed.

Applicant does not disclose any embodiments or data involving even one actinoid species.

Although Applicant discloses examples that include use of rare earth metal catalysts, this is not dispositive upon the instant concern.

Besides offering the lanthanide series catalyst in the examples, Applicant offers nothing else to demonstrate that the reaction proceeds with actinide catalysts. The skilled organic chemist would not prescient analogous chemical behavior of rare earth and transuranium members. Indeed, organic synthesis is an unpredictable art, and without more information, it is difficult to imagine that actinides would be useful in the claimed processes. A reaction might occur between an allyl alcohol and an alcohol, but it is only speculative as to whether a 3-alkoxy-1-propanol species would be formed when substituting an actinide catalyst for a lanthanide catalyst. Although applicants for a United States patent do not need to disclose or explicate details known by one skilled in the art, the description provided by Applicant at the time of filing is incapable of supplementation to render an adequate written description for subject matter drawn to actinide catalysts found in claims 1-3, 7-9 and 13. Hence, the claimed subject matter is not supported as filed, and Applicant has failed to comply with 35 U.S.C. 112.

16. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for condensed phase reactions (perhaps even solution-surface interfacial reactions), does not reasonably provide enablement for gas phase reactivities. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy this aspect of the

enablement requirement and whether any necessary experimentation is “undue.” These factors include, but are not limited to the following:

- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and
- (H) The quantity of experimentation needed to make or use the invention .

In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

#### The Breadth of the claim

Claim 10 covers all reactions between allyl alcohols and alcohols in the presence of a catalyst.

#### Nature of the Invention

The invention envisages reactions between allyl alcohols and alcohols in the presence of a catalyst conducted in the gas phase.

#### Level of One of Ordinary Skill, State of the Prior Art, Level of Predictability in the Art

An organic chemist or chemical engineer having college general and organic chemistry is the benchmark level of ordinary skill. In the area of gas phase reactions, otherwise predictably simple outcomes are no longer the mode. Organic species semi-devoid of solute species react to produce wildly unpredictable compounds, for example, heterogeneous catalysis of combustible materials shows a fantastic array of unpredictable and unresolved synthetic mysteries.

#### Amount of Direction Provided by Inventor and Existence of Working Examples

There is no guidance or working examples provided for the claimed gas phase reactions other than a scant mention in the specification at p. 7 (which is a copy of the instant claim) and p. 19 (which has absolutely no details therein).

Quantity of Experimentation Needed to Make or Use the Invention

While the level of skill in organic chemistry and chemical engineering is high, the quantity of experimentation needed is undue experimentation. One would not be able to practice the invention without not only numerous experimental trials but would need to also work out all conditions for the gas phase synthesis, which is atypical in organic chemistry where wet synthetic methods are the norm.

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

18. Claims 1-7, 13, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "group III" does not identify adequately the subject matter subject to limitation.

***Claim Rejections - 35 USC § 102***

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Yamakawa *et al.*, 2 CATAL. COMM., 191-94 (2001). Claim 15 is directed to the product 3-alkoxy-1-propanol; however, Yamakawa teaches 3-methoxy-1-propanol at p. 191. Under patentability precepts, the product is anticipated regardless of the source of derivation, and the claim language "...produced by the method according to claim 2" carries no weight.

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Moreover, the factual determination will lead to a legal conclusion based upon rationales opined by the Supreme Court in *KSR v. Teleflex*, 550 U.S. 398 (2007).

23. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(c), (f) or (g) prior art under 35 U.S.C. 103(a).

24. Claims 2-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa as applied to claim 2 above, and further in view of US Patent Application No. 10/720,686 (pub. Jul. 29, 2004 as US 2004/0147756) to Miyata *et al.*

a. Claim 2 is directed to making 3-alkoxy-1-propanol via a catalyzed reaction between an allyl alcohol and an alcohol. Claim 3 limits claim 2 by requiring the catalyst to be an oxide, and claim 4 limits claim 3 to certain oxides. Claim 5 limits claim 2 to alkoxide catalysts, while claim 6 limits claim 5 to certain metal alkoxides. Claim 7 limits claim 2 to supported catalysts, and claim 8 limits claim 7 to certain carriers, while claim 9 limits claim 8 carrier surface areas. Claim 10 limits claim 2 to occurrence in the gas phase. Claim 11 limits claim 2 certain alcohols. Claim 12 limits claim 2 to the reaction in the presence of water, and claim 13 limits claim 12 to a certain amount of water. Claim 14 limits claim 2 to a yield rate of the product.

b. Yamakawa teaches the production of 3-methoxy-1-propanol from the reaction of allyl alcohol with methanol at pp. 191-92. (See Yamakawa, equation, p. 191, Experimental section, and Table 1.) The catalysts used are MgO (where reaction is also reported as being in the presence of water), ZrO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, and HY, having a large range of surface areas ( $S_{\text{BET}} = 92.5 - 719 \text{ m}^2/\text{g}$ ). The reaction was performed at 500 K,

sufficient temperature so that appreciable amounts of vapors would be available for reaction.

c. Miyata teaches production of oxygenated and hydroxygenated organic species using a large number of catalysts that include oxide and alkoxide species as well as supported catalysts:

scandium trimethoxide, scandium triethoxide, scandium triisopropoxide, scandium tri-n-propoxide, yttrium trimethoxide, yttrium triethoxide, yttrium triisopropoxide, yttrium tri-n-propoxide, lanthanum trimethoxide, lanthanum triethoxide, lanthanum triisopropoxide, lanthanum tri-n-propoxide, cerium trimethoxide, cerium triethoxide, cerium triisopropoxide, cerium tri-n-propoxide, praseodymium trimethoxide, praseodymium triethoxide, praseodymium triisopropoxide, praseodymium tri-n-propoxide, neodymium trimethoxide, neodymium triethoxide, neodymium triisopropoxide, neodymium tri-n-propoxide, samarium trimethoxide, samarium triethoxide, samarium triisopropoxide, samarium tri-n-propoxide, europium trimethoxide, europium triethoxide, europium triisopropoxide, europium tri-n-propoxide, gadolinium trimethoxide, gadolinium triethoxide, gadolinium triisopropoxide, gadolinium tri-n-propoxide, terbium trimethoxide, terbium triethoxide, terbium triisopropoxide, terbium tri-n-propoxide, dysprosium trimethoxide, dysprosium triethoxide, dysprosium triisopropoxide, dysprosium tri-n-propoxide, holmium trimethoxide, holmium triethoxide, holmium triisopropoxide, holmium tri-n-propoxide, erbium trimethoxide, erbium triethoxide, erbium triisopropoxide, erbium tri-n-propoxide, thulium trimethoxide, thulium triethoxide, thulium triisopropoxide, thulium tri-n-propoxide, ytterbium trimethoxide, ytterbium triethoxide, ytterbium triisopropoxide, ytterbium tri-n-propoxide, ruthenium trimethoxide, ruthenium triethoxide, ruthenium triisopropoxide or ruthenium tri-n-propoxide (Yamakawa, at p. 5, para. 41)

lanthanoid triisopropoxide such as lanthanum triisopropoxide, cerium triisopropoxide, praseodymium triisopropoxide, neodymium triisopropoxide, samarium triisopropoxide, europium triisopropoxide, gadolinium triisopropoxide, terbium triisopropoxide, dysprosium triisopropoxide, holmium triisopropoxide, erbium triisopropoxide, thulium triisopropoxide, ytterbium triisopropoxide or ruthenium triisopropoxide (Yamakawa, at p. 5, para. 42)

The metal catalyst to be used is not particularly limited, and a catalyst supported on carbon, alumina, and calcium sulfate is included. (Yamakawa, p. 6, para. 57)

- d. One skilled in organic chemistry would recognize that, while Yamakawa does not teach the group III, lanthanide, or actinide oxides or alkoxides, the catalyst identity is not that particular for the alkoxy alcohol transformation. The more important factor governing the reaction is the presence of water, where certain Lewis acids would be less effective. In this environment, utilizing group III, lanthanide, or actinide oxides or alkoxides is advantageous. The application of rare earth catalysts, e.g.,  $\text{Sc}(\text{OTf})_3$ ,  $\text{Ce}(\text{OTf})_3$ ,  $\text{Lu}(\text{OTf})_3$ ,  $\text{Sm}(\text{OTf})_3$ , and  $\text{La}(\text{OTf})_3$  was recognized by Berkessel in reactions that produce alcohols and alkoxy alcohols (See Berkessel *et al.*, 254 Appl. Catal. A, 27-34 (2003).) Additionally, Kobayashi extols the benefits of using Lewis acid catalysts in organic synthesis in the presence of water. (See Tables and equations throughout Kobayashi *et al.*, 72 Pure Appl. Chem., 1373-80 (2000).)
- e. The surface areas appearing in claim 9 are mere optimizations of that taught by Miyata, and, given similar conditions, an organic chemist expects like reactions to occur with similar yields. Likewise, claims 13 and 14 fail to further limit the process of claim 2, and, if anything, are mere optimizations of the process. Further, differences in concentration, yield, yield rate, surface area, or temperature do not support the patentability of subject matter encompassed by the prior art. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) Optimizations fail to further limit the process



and are a matter that an organic chemist is keenly aware of and typically performs at the bench.

f. One skilled in the art would thus be motivated to utilize the processes and teachings of the prior art to arrive at the instant claimed process with the expectation of producing the alkoxy alcohol. The instant claimed invention would have been suggested to one skilled in the art, and, therefore, the instant claimed invention would have been obvious to one skilled in the art.

25. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa and Miyata as applied to claims 2-15 above, and further in view of US Patent Application No. 10/814,859 (pub. Oct. 6, 2005) to Chaudhari *et al.*

Claim 1 is directed to production of 1,3-propanediol via the hydrolysis of the product from the process of claim 2. Chaudhari teaches the production of 1,3-propanediol via hydrolysis of 3-carboxy propanol. Although the precursors to the diol are not identical, the use of analogous reactants in a known process is *prima facie* obvious. *In re Durden*, 226 USPQ 359 (1985). Once the general reaction has been shown to be old, the burden is on Applicants to present reasons or authority for believing that a group on the starting material would take part in or affect the basic reaction and thus alter the nature of the product or the operability of the process. In looking at the instant claimed process as a whole, as stated in *In re Ochiai*, 37 USPQ 2d 1127 (1995), the claimed process would have been suggested to one skilled in the art.

One skilled in the art would thus be motivated to utilize the process of the prior art to arrive at the instant claimed process with the expectation of producing the diol. The instant

claimed invention would have been suggested to one skilled in the art, and, therefore, the instant claimed invention would have been obvious to one skilled in the art.

26. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

***Correspondence***

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOBY D. HAIN whose telephone number is (571)270-1329. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM (except every other Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/TOBY D HAIN/  
Examiner, Art Unit 4131**

**/James O. Wilson/  
Supervisory Patent Examiner, AU 1624**